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Further Decline in Canada's Merchant Shipping.

Each succeeding report from the department of marine and fisheries, Canada, shows a decline in merchant shipping. In 1887 there were owned in the Dominion 7,178 vessels of 1,130,247 tons register. A report just submitted to parliament shows that the total number of vessels remaining on the register books on Dec. 31, 1894, including old and new vessels, sailing vessels, steamers and barges, was 7,245, measuring 869,624 tons, register tonnage, being a decrease in tonnage of 42,915 tons as compared with 1893. The number of steamers on the registry books on the same date was 1,640, with a gross tonnage of 240,906 tons. Assuming the average value to be \$30 per ton, the value of the registered tonnage of Canada, on Dec. 31, last, would be \$26,088,720.

The number of new vessels built and registered in the dominion during the last year was 326, but they measured only 21,243 tons, register tonnage. Estimating the value of the new tonnage at \$45 per ton, it gives a total value of \$955,935 for new vessels. In the province of Ontario (lake district) the number of vessels built in 1894 was sixty-four, but their aggregate tonnage was only 3,137. Only one of them was of more than 300 net tons register.

The following table, prepared from the latest report of the marine department of the government, shows the decline in shipping during the past eight years:

MERCHANT VESSELS OF ALL KINDS OWNED IN THE DOMINION OF CANADA ON DEC. 31 OF EACH YEAR DURING EIGHT YEARS PAST.

PROVINCES.	1887.		1888.		1889.		1890.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
New Brunswick.....	1,027	255,126	1,009	239,332	1,013	218,873	981	209,460
Nova Scotia.....	2,845	498,878	2,851	485,709	2,855	464,431	2,793	464,194
Quebec.....	1,586	189,064	1,498	178,520	1,455	168,500	1,399	164,003
Ontario.....	1,275	139,548	1,330	139,502	1,352	141,839	1,312	138,738
Prince Edward Island.....	225	29,031	218	26,586	224	25,506	231	26,080
British Columbia.....	149	12,789	167	14,249	176	15,241	196	16,024
Manitoba.....	71	5,811	69	5,745	77	6,091	79	6,475
Totals.....	7,178	1,130,247	7,142	1,089,642	7,153	1,040,481	6,991	1,024,974

	1891.		1892.		1893.		1894.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
New Brunswick.....	969	193,193	946	181,779	1,010	156,086	1,003	136,257
Nova Scotia.....	2,778	461,758	2,731	425,690	2,715	396,263	2,710	371,432
Quebec.....	1,404	162,330	1,408	162,638	1,426	161,121	1,427	160,590
Ontario.....	1,345	138,914	1,347	141,750	1,370	146,665	1,480	148,525
Prince Edward Island.....	195	23,316	196	22,706	188	20,970	191	19,650
British Columbia.....	246	19,767	298	23,448	315	24,900	336	26,455
Manitoba.....	78	6,197	81	6,118	89	6,534	98	6,715
Totals.....	7,015	1,005,475	7,007	964,129	7,113	912,539	7,245	869,624

Tons are registered tons.

Canadian Surveys—Lake Erie Next.

Now that the survey of Georgian bay has been completed, Chief Engineer William Anderson of the Canadian marine department announces that it has been decided to continue the work with the steamer Bayfield on the remaining Canadian waters of the Great Lakes. In a late report to the department of marine and fisheries the chief engineer says: "Eleven seasons have been taken up in the survey of Georgian bay and the north channel of Lake Huron, and the cost has been \$215,389.21, but against this amount should be credited a portion of the cost of the surveying steamer Bayfield, and of all the surveying instruments and other supplies in possession of the department available for surveys in other parts. With the possible exception of Lake Superior, none of the other lakes will take anything like that amount of time or money. The use of deeper draught vessels and the increasing speed of steamers make the demand for reliable charts very urgent. Mr. W. J. Stewart who has been in charge of surveys, was instructed on the completion of the work on Georgian bay to continue with the coast of Lake Huron, and carried a preliminary triangulation from the gap at Cove island light-house along the south shore of Manitoulin island. This work will be required in connection with the survey of the main waters of Lake Huron. It has, however, been decided to take up the survey of the north shore of Lake Erie this season, both because the quantity of traffic in the lake is important and the coast dangerous, and because the completion of this survey is a preliminary necessity to a correct definition of the international boundary line."

How to do Much Digging for Little Money.

The problem in the Chicago drainage canal has been largely how to do much digging for little money. The vast amount of earth and rock to be handled—in round numbers 40,000,000 cubic yards—and the low prices obtained for this work, have exercised the ingenuity and energy of both engineers and contractors to the utmost. The policy of letting the work in short sections to many contractors, and the variability of the material to be excavated, have operated to develop a great variety of different devices for accomplishing the work to be done. It is not too much to say that nowhere at any time in the history of the world have so many novel and different machines for excavating and removing earth and rock been in operation within so small a territory. Methods and apparatus for carrying on the work will challenge the whole world for efficiency and economy, and yet it can be said that, with the experience of the Manchester, Baltic, Suez and other great canal works before them, none of the characteristic English, German and French methods of work were adopted by the Chicago engineers. The idea of a waterway across the Chicago divide is a hundred years older than American independence, and the suggestion for a drainage channel to carry Chicago's sewage to the Mississippi river dates back to the infancy of that city. Louis Joliet, the French explorer, advocated the one in 1674, and in 1855 Mr. E. S. Chesbrough foresaw the necessity of the other. Neither of these men, it is almost needless to say, ever contemplated a work of the magnitude and importance of the one now under way. The project which was but an idea with them, has been pushed to a reality within the last decade largely through the efforts of a few public-spirited men, among whom Mr. Lyman E. Cooley stands foremost in his persistent advocacy and energetic execution of the undertaking. It is not our purpose to enlarge upon the work of Mr. Cooley and his co-laborers here, but any description of the great canal which fails to note it, fails to note one of the forces which has made one of the greatest and most needed sanitary engineering works in the world an actuality.—Engineering News.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on May 18, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago.....	19,433,000	4,534,000
Duluth.....	10,011,000
Milwaukee.....	283,000
Detroit.....	450,000	155,000
Toledo.....	411,000	355,000
Buffalo.....	1,784,000	240,000
Total.....	32,372,000	5,284,000

After numerous conferences with bureau chiefs of the navy, Secretary Herbert has ordered plans made for the new battleships with the following features: Battery of four 13-inch guns, four 8-inch guns and fourteen 5-inch guns; 8-inch turrets to be superimposed upon 13-inch turrets, and only two to be built, one forward and the other aft; draft, extreme, 25 feet; speed, 16 knots under 1 inch air pressure; coal supply, normal, 500 tons; armour to be 15 inches in thickness, and more generally distributed over the ship than in plans heretofore followed, and the belt to be 8 feet deep, extending a foot more out of water than in the plans pursued in the case of the battleships of the Indiana class. The Indiana's belt is 7½ feet deep, and is too low in water to satisfy the ordnance experts. There is a possibility that some changes may be made in the plans on account of weights. If it is found that to include these features the displacement will be greater than that authorized by congress—10,000 tons—some changes will have to be made.

As long ago as 1550 a Spaniard conceived the idea of a canal through Nicaragua, and it is said that when Nelson was there in 1780 he revived the plan. But it was not until about a hundred years later that the project was taken up by the United States with ardor, and General Grant made it his especial hobby. In 1876 a commission reported favorably upon it to congress, and ten years later an association was formed to obtain the needful concessions from Nicaragua, and to take steps for the location and final surveys of the line of route.

A Valuable Iron Mine.

Some ore will be shipped this season from a mine on the Vermillion range that is expected to cut quite a figure in the market next year. The property is the Pioneer, which is owned by Oglebay, Norton & Co. and Capt. Thomas Wilson of Cleveland, and Minneapolis parties. It is understood that 100,000 tons of ore of the very highest grade could be moved from this mine during the present season if the management was disposed to hurry shipments. Operations at the mine for some time past have, however, been directed towards economical mining charges. Although a very deep shaft has been sunk into one of the largest veins of high-grade Bessemer ore as yet found in the Lake Superior region, the owners of the mine, who are practical men in the business, are not hurrying shipments but are directing attention to a heavy output later on at a low cost of production. The property includes four forties, adjoining the Chandler, and the ore is a continuation of the Chandler vein, said to be of greater extent than the Chandler itself. At a meeting of the company in Chicago recently, H. B. Sturtevant, who was assistant superintendent of the Ashland mine, Gogebic range, was appointed superintendent of the mine.

In General.

An illustrated article on the Sailors' Snug Harbor of New York, appears in Frank Leslie's Monthly for June.

A hollow gaff will be a feature of the yacht Defender. It will be 54 feet long and will be well braced on the inside. The boat will also have another gaff, which will be solid, but the hollow one will in all probability be used during the races in September.

In Japan, the land of pretty ways and customs, no wine is spilled over the bow of a vessel at launching, but instead a cage containing birds of several kinds is provided, and as the ship begins to move the birds are liberated. They fly to all parts of the compass, typifying the nature of commerce.

In renewing his subscription to the MARINE REVIEW, G. R. McDermott, professor of naval architecture at Sibley College, Cornell University, says: "I take this opportunity to say that I am thoroughly well pleased with the REVIEW. Although a subscriber to other marine papers, none give the same satisfaction as yours, and I trust that it will continue to meet with the success which it merits."

Orders have been issued by Secretary Herbert for the test of a substitute for cellulose. The invention is presented for examination by a Philadelphia man, who has discovered its alleged efficacy as an absorbent. The new material is composed of cornstalk fibre. Actual tests of it have given extraordinary results. A quantity was packed in a box, with a density of about 7 inches per cubic foot. This box was fired at with a 6-pounder, making in one portion a single hole, and in another portion five shots were grouped in a circle of about 4 inches radius. A pressure of water varying from 4 to 7 feet was maintained on one side of the shot hole, and after three hours no water had come through on the other side of the box, its thickness being 3 feet. On examination it was found that the water had penetrated in the case of the group of five shot holes to the depth of 12 inches only. The material is a native product both in growth and manufacture, having about one-third of the density of the best foreign substance, besides being absolutely incombustible.

Forced and Induced or Suction Draft.

Editor MARINE REVIEW: The question is often asked and oftener thought about, what is the difference between forced and induced or suction draft? Is there really any difference, and is it not merely a "distinction" without a difference? To try and prove that the difference is very great and indeed almost "radical," is the object of this communication.

In the first place, induced or suction draft is nothing more nor less than natural draft intensified. That is to say, there are no troubles or difficulties of any kind arising from its use that would not be met with in the use of natural draft with a high smokestack or chimney. With forced draft the pressure of the air being behind the gases, they are driven in a solid body against the plate on the opposite side of the combustion chamber and then left to find their way into the tubes as best they can. As the result of this the gases reverberate or rebound on the tube sheet, part of them undoubtedly entering the tubes, but the remainder impinging or striking against the tube-sheet between the tubes, and heating it to such a degree as to cause trouble from leakage with the tube ends and with the tube-sheet itself. With the Ellis & Eaves system, the gases never reach the opposite side of the combustion chamber in a solid body, but are sucked directly into the orifice of the tubes in streams as they come from the furnace, because there is nothing behind them to thwart this action and consequently the tube-sheet is kept comparatively cool, and there is no appreciable difference between the temperature of the tube-sheet and the tube ends, and hence with this draft there is never any difficulty with the tubes from leakage.

The principal difficulty with forced draft has always been its injurious

effect upon the ends of the tubes and on the tube-sheet by its "blow-pipe" action, and to try and overcome this, all sorts of expedients have been resorted to without success. On the other hand, with the Ellis & Eaves suction draft, no difficulty whatever has been experienced with the tube ends or with any other part of the boiler, either in long or short voyages, three steamers with it in, viz, the Perthshire, Buteshire and Banffshire of Turnbull, Martin & Co's line, running between London and Australia, and the Berlin, Kensington and Southwark of the American line, running the New York and Philadelphia—Southampton and Liverpool routes, besides others, and all with the most satisfactory results.

We have produced with the Ellis & Eaves draft in combination with Serve ribbed tubes in Scotch marine boilers in our works in Sheffield, a suction equal to 6 inches of water, and a combustion equal to 60 pounds of coal per square foot of grate, and with no unfavorable effects of any kind either on the tubes, tube-sheet or any other part of the boiler. And besides this, we have in the steamer Kensington produced one I. H. P. with 1.4 pounds of bituminous coal. Is there any known system of forced draft of which, under this same conditions, this can be said?

The greater cleanliness of the suction draft is another strong point in its favor, the particles of coal dust and ashes being sucked up through the smokestack instead of being blown all over the ship. The fire room or stokehold with the Ellis & Eaves draft is much cooler than with either natural, forced or closed stokehold draft, so that the firemen are always in a condition to do better work and more of it without exhaustion.

In the power plant of the American line at the foot of Fulton street, North river, New York City, are two boilers of the Scotch marine type, precisely alike in all respects, except that one is fitted with $3\frac{1}{4}$ inch O. D. plain tubes with retarders and the other with $3\frac{1}{4}$ inch O. D. Serve ribbed tubes with retarders, both being used in combination with the Ellis & Eaves draft. I annex herewith the result of three trials of the boilers separately, showing an increase in evaporation in favor of the boiler fitted with Serve ribbed tubes of 21 per cent. and with less fuel than than burned in the boiler with plain tubes.

TRIALS—POUNDS OF WATER EVAPORATED PER POUND OF COAL.

	SEPT. 28, 1894.	OCT. 5, 1894.	SEPT. 29, 1894.
	Plain tubes.	Plain tubes.	Serve tubes.
Per pound of coal.....	6.600	6.693	8.225
Combustible.....	7.455	7.674	9.290
Coal from and at 212°.....	7.228	7.274	8.939
Combustible.....	8.165	8.332	10.097

Finally, with the Ellis & Eaves draft there is perfect combustion and consequently no smoke, no matter what description of coal is used, and this can not be said of any other system and is of itself the strongest possible refutation of the statement made by uninformed persons, that there is no difference between induced and forced draft. Smoke is simply unconsumed carbon, and just in the proportion that fuel smokes, no matter from what cause, in the same proportion is the fuel being wasted. If there was no other advantage connected with the use of this draft, or no other evidence of its value, the immunity or freedom from smoke, we think, should carry conviction with it and entitle it to the preference.

CHARLES W. WHITNEY.

Manhattan Life Building, 64, 66 and 68 Broadway,
New York City, May 27, 1895.

Complaint has been made that there is not as much water in Niagara river as was claimed for the several parts where dredging has been under way. Major Ruffner of Buffalo, the United States engineer in charge, accordingly made an inspection of the river and gives out this information: The Horse Shoe reef channel is in good condition and has the full depth of 16 feet, at mean lake level. A dredge is engaged in cleaning up the low ridges left from the dredging operations of the past three years, and this will take some weeks yet. In passing this reef the ranges should be followed as far as the red can buoy only. From this point vessels should head to the west of the inlet pier, or water-works crib, and pass that between 300 and 500 feet to its west. If they are closer than that they may strike a shoal with 15 feet 6 inches of water on it, some 100 yards, and more, below the crib. When opposite the ferry landing, on the Canadian shore (but not before reaching this point), they should head for the upper buoy of the bridge channel. In going down the Strawberry island channel the best water will be found about 50 feet from the three black spar buoys. A dredge is now engaged in removing it. This dredge is instructed to denote to coming vessels, by whistle, which side the boat should take. As soon as the channel there is made safer, notice will be given from Maj. Ruffner's office.

Gross tonnage of the St. Louis, new American liner, is 11,629.21.

Lake Freight Matters.

It is encouraging to report that at this time there are no vessel owners willing to duplicate contracts made before the opening of navigation for carrying ore throughout the season, and this is the first time since 1890 that such a condition has prevailed thus early in the season. The ore freight market has maintained an advancing tendency since the first cargo was moved in the spring, and although there is little profit in freights, vessel owners are very much encouraged, as there has as yet been little coal moved to Lake Michigan and practically none at all to Lake Superior. Ore freights have reached 80 cents from the head of the lakes, 70 cents from Marquette and 50 cents from Escanaba, and the feeling is still strong, but it is probable that the market will rest at these figures for a while, as shippers will resist advances over contract rates. They have been hurrying stock-pile shipments on the low freights that have thus far prevailed, but will be disposed to reduce the movement if further effort is made to bulge the market. Difficulties in the soft coal mining regions are now generally settled, but supplies of coal for lake shipment are slow in reaching Ohio ports. It is expected that some of the leading shippers will offer some Lake Superior coal on contracts next week, but vessel owners are not disposed to accept a 30-cent freight rate, which is all that has been talked of as yet.

Naval Architecture at Cornell.

Draughtsmen, designers and all others connected in any way with naval architecture and marine engineering will be interested in the opportunities for special study offered at the school of marine engineering and naval architecture, which is a department of Sibley College, Cornell University, Ithaca, N. Y. In a letter to the REVIEW, G. R. McDermott, professor of naval architecture at this school, says:

"We have quite a number of students in both departments (marine engineering and naval architecture), two of these being special students from Detroit. They are both men who have been in practical life and who, feeling a want of a better acquaintanceship with the fundamental principles of their art, decided to take our course, one for one year, the other for two years. Both are doing excellent work and are entirely satisfactory. This is a class of students we are particularly pleased to have, and we aim specially to give them instruction in just what they find themselves most in need of, and which they could not well get in the ordinary routine of business life. As you will note in our regulations regarding special students, they have no entrance examination, and with an ordinary education there are many men in the drawing offices and other departments of the ship yards of the country who would find it to their advantage to spend a year, in their special line of work, at our school."

In a circular announcing courses of instruction the following is found regarding special students:

"Under the regulations of the university, persons who are twenty-one years of age, and who give evidence of sufficient ability and experience to enable them to carry on with profit university courses in the subjects in which they are interested, may be nominated to the faculty as special students, admitted without examination, and permitted to take up such work as they may seem qualified for, under the direction of the head of department. Such special students are not considered as candidates for a degree, but may receive, if desired, a statement of the work which they have accomplished. Such students may become candidates for a degree by making up entrance requirements, together with such differences as may exist between the regular course and the special course which they have followed."

"Under these conditions persons who may already have some knowledge of marine construction, but who may wish to acquire a more exact knowledge of fundamental principles and approved methods, or who may wish to pursue special studies on certain topics connected with the subject, may spend with great profit a year or more in this school in their special work. The work of the school is very largely individual, so that each one is able to give special attention to such subjects as he may be interested in, and to pursue these subjects independently of others under the direct guidance and aid of the professors in charge."

Questioning the Unique's Time.

Editor MARINE REVIEW: In your issue of May 23, under the heading "Fast Steamer Unique," distances are quoted which are incorrect, and all of which are given in favor of the steamer. It is stated first that the distance from Windmill point to Woodward avenue is seven miles, when it is but $6\frac{3}{4}$ miles. The distance across Lake St. Clair is stated as 18 miles, when in fact it is only $16\frac{1}{2}$ miles, and this is the longest course run by large freight steamers, while light-draft steamers like the Unique, not having to run out in the regular channel at Grosse point, cut considerable off those figures. It is further stated that the Unique made the run across Lake St. Clair in 1 hour 6 minutes, and from Windmill point to Woodward avenue in 19 minutes 50 seconds, or a total of 1 hour 25 minutes and 50 seconds, and this distance is said to be 25 miles, when in fact it is

less than $23\frac{1}{2}$ miles, and the steamer's speed is thus reduced from over 21 miles to an actual speed of $16\frac{3}{8}$ miles an hour.

Now while I do not care to enter into a discussion as to the speed of this steamer, I will add that I have on several occasions gone over this same course and distance in less time than it is claimed the Unique has made, and know that we have fully a dozen steamers in our vicinity that can to-day lower this so-called record of the Unique. The steamer Greyhound of the Red Star line has on several occasions made the same run in less than 1 hour 25 minutes, with a full load of passengers and considerable freight, and with several others I have taken the time, and can vouch for its correctness. As to the corrected distances which I give, I will add that they are positively correct.

J. W. WESTCOTT,

Detroit, Mich., May 26, 1895.

Aliens on American Vessels.

The decision recently rendered by United States Attorney-General Olney relative to engineers of the American line steamers Paris and New York is of special importance on the lakes, on account of interest attached to the question of alien officers on American vessels. The attorney-general has decided that the act of 1874, which permitted the granting of licenses to pilots and engineers who had lived in the United States for six months and who had declared their intentions to become citizens, if found qualified, had not been repealed by the act of 1884, which requires that all officers of American steam vessels shall be citizens of the United States. This decision will permit any qualified alien who has been in the United States six months, and who has declared his intention of becoming a citizen, to receive a license as engineer or pilot of any American merchant steam vessel, but not as master. The letter from the attorney-general to the secretary of the treasury on the subject is as follows:

The Honorable the Secretary of the Treasury—Sir: I have the honor to acknowledge yours of April 23, 1894, asking my opinion upon the question whether the statute known as the "Dingley bill," approved June 26, 1884, amending section 4,131 of the revised statutes, repealed an act entitled "an act to authorize the employment of certain aliens as engineers and pilots," approved April 17, 1874. As the law stood prior to the act of 1884, above cited, two classes of persons were competent to receive licenses as engineers or pilots on United States vessels. Citizens of the United States were one class. Aliens on the way to citizenship by having declared their intention to become citizens and by permanent residence in the United States for six months prior to the granting of licenses constituted another class.

The amendatory act of 1884 did not affect, and was not made to affect, either of these classes. Leaving them undisturbed, it was obviously designed to make provision for a third class of persons who might be officers of United States vessels under peculiar circumstances and for brief periods. The members of both the classes first named are regarded as in effect citizens of the United States, and as being eligible as such to permanent employment—as officers of United States vessels generally under revised statutes, section 4,131, and as engineers or pilots of such vessels under the act of April 17, 1874. The members of the third class, on the other hand, are aliens whom the law excludes from general and permanent employment on United States vessels and permits to serve on such vessels only temporarily and in emergencies.

The provisions of the act of June 26, 1884, being thus in no way in conflict or inconsistent with the act of April 17, 1874, both statutes must be regarded as in force and the later did not have the effect of repealing the former statute.

Department of Justice,

Washington, D. C., May 9, 1895.

RICHARD OLNEY,

Attorney-General.

No effort was made to speed the new Northern line passenger steamer North Land on the occasion of her first trial of machinery in the lake off Cleveland on Saturday last, but it was found that her engines, as well as those of the North West this season, turn up with special satisfaction to both builders and owners, on account of a change of valve gear and other alterations of detail that were suggested through last year's operations with the North West. These changes have caused everybody interested in the steamers to feel satisfied that they will have no difficulty whatever in maintaining schedule time. From what can be learned of the trials made with anthracite coal on the North West, it is hardly probable that hard coal will be adopted. The greatest difficulty encountered with it has been in cleaning fires. Although these big boats have enormous boiler power, the surplus is thought to be hardly sufficient to cope with the delay encountered when, in cleaning hard coal fires under three boilers at a time, a full hour is lost with that number of boilers. A quantity of Pocahontas coal was tried on the trial of the North Land, and the effect as regards absence of smoke was wonderful. The management has taken up the question of using Pocahontas coal entirely.

AN ARTISTIC PHOTO OF THE NORTH WEST, HANDSOMELY MOUNTED, SENT TO ANY ADDRESS FOR 50 CENTS, BY THE MARINE REVIEW. MONEY RETURNED IF YOU ARE NOT SATISFIED.

New Rules for Tonnage and Crew's Quarters.

The last congress passed a law changing the method of determining the net tonnage of vessels. One feature of the law, providing 75 cubic feet per man as crew space, will go into effect on the 30th of next month. The law otherwise has been in effect since April. Although the practice on the lakes has, as a rule, been very liberal in the matter of quarters for crews, ship builders and owners will be interested in the new law on the subject, and also in the regulations sent out by the commissioner of navigation with reference to the whole matter of tonnage measurements. A circular on the subject from Mr. Chamberlain follows:

TREASURY DEPARTMENT,
BUREAU OF NAVIGATION,
WASHINGTON, D. C. }

To Collectors of Customs and Others: The regulations below will hereafter be observed in determining the net tonnage of vessels of the United States, under the following act approved March 2, 1895, "to amend section 1 of chapter 398 of the laws of 1882, entitled an act to provide for deductions from the gross tonnage of vessels of the United States:—"

Be it enacted that section 1 of chapter 398 of the laws of 1882, approved August 5, 1882, entitled "an act to provide for deductions from the gross tonnage of vessels of the United States," be amended so as to read:

"That section 4,153 of the revised statutes of the United States be amended by inserting before the last paragraph thereof the following words: 'That from the gross tonnage of every vessel of the United States there shall be deducted—"

"(a) The tonnage of the spaces or compartments occupied by or appropriated to the use of the crew of the vessel. Every place appropriated to the crew of the vessel shall have a space of not less than 72 cubic feet and not less than 12 superficial feet, measured on the deck or floor of that place, for each seaman or apprentice lodged therein. Such place shall be securely constructed, properly lighted, drained and ventilated, properly protected from weather and sea, and as far as practicable properly shut off and protected from the effluvia of cargo or bilge water; and failure to comply with this provision shall subject the owner to a penalty of five hundred dollars. Every place so occupied shall be kept free from goods or stores of any kind not being the personal property of the crew in use during the voyage; and if any such place is not so kept free the master shall forfeit and pay to each seaman or apprentice lodged in that place the sum of 50 cents a day for each day during which any goods or stores as aforesaid are kept or stored in the place after complaint has been made to him by any two or more of the seamen so lodged. No deduction from tonnage as aforesaid shall be made unless there is permanently cut in the beam and over the doorway of every such place the number of men it is allowed to accommodate with these words: "Certified to accommodate—seamen."

"(b) Any space exclusively for the use of the master certified by the collector to be reasonable in extent and properly constructed, and the words "certified for the accommodation of master" to be permanently cut in a beam and over the door of such space.

"(c) Any space used exclusively for the working of the helm, the capstan, and the anchor gear, or for keeping the charts, signals, and other instruments of navigation and boatswain's stores, and the words "certified for steering gear," or "certified for boatswain's stores," or "certified chart house," as the case may be, to be permanently cut in the beam and over the doorway of each of such spaces.

"(d) The space occupied by the donkey engine and boiler, if connected with the main pumps of the ship.

"(e) In the case of a ship propelled wholly by sails any space, not exceeding 2½ per cent. of the gross tonnage, used exclusively for storage of sails; provided, that spaces deducted shall be certified by the collector to be reasonable in extent and properly and efficiently constructed for the purposes for which they are intended, and the words "certified for storage of sails" to be cut on the beam and over the doorway of such space.

"(f) In the case of a ship propelled by steam or other power requiring engine room, a deduction for the space occupied by the propelling power shall be made, as follows: In ships propelled by paddle wheels in which the tonnage of the space occupied by and necessary for the proper working of the boilers and machinery is above 20 per cent. and under 30 per cent. of the gross tonnage, the deduction shall be 37 per cent. of the gross tonnage; and in ships propelled by screws in which the tonnage of the space is above 13 per cent. and under 20 per cent. of the gross tonnage, the deduction shall be 32 per cent. of the gross tonnage. In the case of screw steamers the contents of the trunk shaft shall be deemed spaces necessary for the proper working of the machinery.

"(g) In the case of other vessels in which the actual space occupied by the propelling machinery amounts in the case of paddle vessels to 20 per cent. or under and in the case of screw vessels to 13 per cent. or under of the gross tonnage of the ship, the deduction shall consist in the case of paddle vessels of once and a half the tonnage of the actual

machinery space and in the case of screw vessels of once and three-fourths the tonnage of the actual machinery space. But if the actual machinery space is so large as to amount in the case of paddle vessels to 30 per cent. or above, and in the case of screw vessels to 20 per cent. or above of the gross tonnage of the ship, the deduction shall consist of 37 per cent. of the gross tonnage of the ship in the case of a paddle vessel and 32 per cent. of the gross tonnage in the case of a screw vessel; or if the owner prefers there shall be deducted from the gross tonnage of the vessel the tonnage of the space or spaces actually occupied by or required to be inclosed for the proper working of the boilers and machinery, including the trunk shaft or alley in screw steamers, with the addition in the case of vessels propelled with paddle wheels of 50 per cent. and in the case of vessels propelled by screws of 75 per cent. of the tonnage of such space.

"(h) If there be a break, a poop, or any other permanent closed-in space on the upper deck available for cargo or stores, or for the berthing or accommodation of passengers or crew, the tonnage of that space shall be ascertained and added to the gross tonnage; provided, that nothing shall be added to the gross tonnage for any sheltered space above the upper deck which is under cover and open to the weather—that is, not inclosed.

"(i) On a request in writing to the commissioner of navigation by the owners of a ship the tonnage of such portion of the space or spaces above the crown of the engine room and above the upper deck as is framed in for the machinery or for the admission of light and air and not required to be added to gross tonnage shall, for the purpose of ascertaining the tonnage of the space occupied by the propelling power, be added to the tonnage of the engine space; but it shall then be included in the gross tonnage; such space or spaces must be reasonable in extent, safe and seaworthy, and can not be used for any purpose other than the machinery or for the admission of light and air to the machinery, or boilers of the ship. And the proper deduction from the gross tonnage having been made, the remainder shall be deemed the net or register tonnage of such vessels. The register or other official certificate of the tonnage or nationality of a vessel of the United States, in addition to what is now required by law to be expressed therein, shall state separately the deductions made from the gross tonnage, and shall also state the net or registered tonnage of the vessel. But the outstanding registers or enrollments of vessels of the United States shall not be rendered void by the addition of such new statement of her tonnage, unless voluntarily surrendered; but the same may be added to the outstanding document or by an appendix thereto, with a certificate of a collector of customs that the original estimate of tonnage is amended.

"In the case of a ship constructed with a double bottom for water ballast, if the space between the inner and outer plating thereof is certified by the collector to be not available for the carriage of cargo, stores, or fuel, then the depth of the vessel shall be taken to be the upper side of the inner plating of the double bottom, and that upper side shall for the purposes of measurement be deemed to represent the floor timber.

SEC. 2. That this act shall not be construed to require the remeasurement of any American vessel duly measured before April 1, 1895; but upon application by the owner of any such vessel collectors of customs shall cause such vessel, or the spaces to be deducted, to be measured according to the provisions of this act, and if a new register is not issued the statement of such remeasurement shall be attached by an appendix to the outstanding register or enrollment with a certificate of the collector of customs that the original estimate of tonnage is amended pursuant to this act.

SEC. 3. That the provisions of this act requiring a crew space of 72 cubic feet per man shall apply only to vessels, the construction of which shall be begun after June 30, 1895.

SEC. 4. That under the direction of the secretary of the treasury the commissioner of navigation shall make regulations needful to give effect to the provisions of this act.

SEC. 5. That this act shall take effect on April 1, 1895.

In accordance with the foregoing act, the following regulations are provided:

1. No space will be deducted from gross tonnage in ascertaining net tonnage unless it has been included in gross tonnage.

2. The limitation of all deductions to 50 per cent. of gross tonnage has been repealed.

3. Crew spaces: The restriction of crew spaces to 5 per cent. of the gross tonnage of the vessel has been repealed, and after April 1 the actual spaces occupied by or appropriated to the use of the crew will be measured and deductions be made for them. But these spaces must be constructed according to the provisions of paragraph a of the act, and a failure to comply with those requirements will be reported by the measurer to the collector of customs. The provision of the act requiring 72 cubic feet per man as crew space applies only to vessels begun after June 30, 1895. No deduction from tonnage shall be made for crew spaces unless there is permanently cut in a beam and over the doorway of every such place the number of men it is allowed to accommodate with these

words: "Certified to accommodate—seamen." In spaces appropriated to the use of the crew may be included spaces necessary to shelter the cook when employed in the preparation of provisions and the engineer when employed in condensing water for the crew. Also water closets or privies for the officers and crew. Mess rooms and bath rooms or wash rooms exclusively for the use of the officers or crew are included in the spaces appropriated to the use of the crew of the vessel. These spaces must be reasonable in extent, and if they are used by passengers no deduction shall be made.

4. The space including sleeping room, dressing room, and bath room, for the use of the master, will be stated separately on the certificate of registry. It must be exclusively for his use and certified to be reasonable in extent and properly constructed, and the words "certified for the accommodation of master" must be permanently cut in a beam and over the door of such space.

5. Helm, capstan and anchor gear spaces, the wheelhouse for sheltering the man at the wheel, spaces for keeping charts, signals, and other instruments of navigation, and boatswain's stores, must be reasonable in extent, and marked according to the law.

6. If the donkey engine and boiler are within the boundary of the engine room, and the machinery is used in connection with the main machinery, the space occupied by them is not entitled to a separate deduction in addition to the deduction made for propelling power.

7. Propelling power in steam vessels: The gross tonnage of the hold should be ascertained when the hold is sufficiently complete and clear for the purpose, before the building and fitting of the actual engine room, and measurers should be notified by builders when steam vessels have reached the point of construction which permits gross tonnage to be ascertained. The actual space occupied by the boilers, engines, and machinery will be ascertained according to the rules now in force, and this actual space will then be compared with the gross tonnage of the vessel. When the actual space is between 20 and 30 per cent. of the gross tonnage of a paddle vessel, 37 per cent. of this gross tonnage shall be deducted for propelling power. When the actual space is between 13 and 20 per cent. of the gross tonnage of a screw vessel, 32 per cent. of the gross tonnage shall be deducted for propelling power. When the actual space is 20 per cent. or less of the gross tonnage of a paddle vessel, multiply the actual space by 1.5 to obtain the deduction allowed for propelling power. When the actual space is 13 per cent. or less, of the gross tonnage of a screw vessel, multiply the actual space by 1.75 to obtain the deduction allowed for propelling power. When the actual space is 30 per cent. or over of a paddle vessel and 20 per cent. or over of a screw vessel, the owner shall designate which method of deduction he elects. If a paddle vessel, 37 per cent. of gross tonnage, or actual space multiplied by 1.5; if a screw vessel, 32 per cent. of gross tonnage, or actual space multiplied by 1.75. If the owner does not make a choice, method *a* will be adopted.

8. If application for remeasurement of a steam vessel measured before April 1, 1895, to bring its certificate into accord with the provisions of this act, is made, it will not be necessary to measure the spaces for propelling power. Take the deduction for propelling power given in the outstanding certificate, and, if the vessel be a screw vessel, divide that deduction by 1.75; if a paddle vessel, divide by 1.50, and the result will be the actual spaces occupied by boilers and engines. These actual spaces may then be compared with the gross tonnage, to ascertain the percentage and the rule according to which the new certificate of measurement shall be made out. Actual measurement is to be avoided if practicable, unless there is a reason to believe the outstanding certificate of measurement is incorrect.

9. A request to the commissioner of navigation that spaces above the crown of the engine room and above the upper deck (framed in for machinery or for the admission of light and air and not required to be measured), be measured in order to obtain the benefit of a higher deduction for propelling power, must be accompanied with a description and sketch of tracing of the spaces, the measurement thereof, and the collector's certificate that they conform to the requirements of paragraph (i) of the act.

10. Where the top of the double bottom for water ballast is horizontal, the transverse areas will be measured as heretofore provided by law, but where there are breaks in the double bottom, the length of the vessel will be taken in parts according to the number of breaks, and each part divided into a number of equal parts according to the classes in section 4,153, revised statutes.

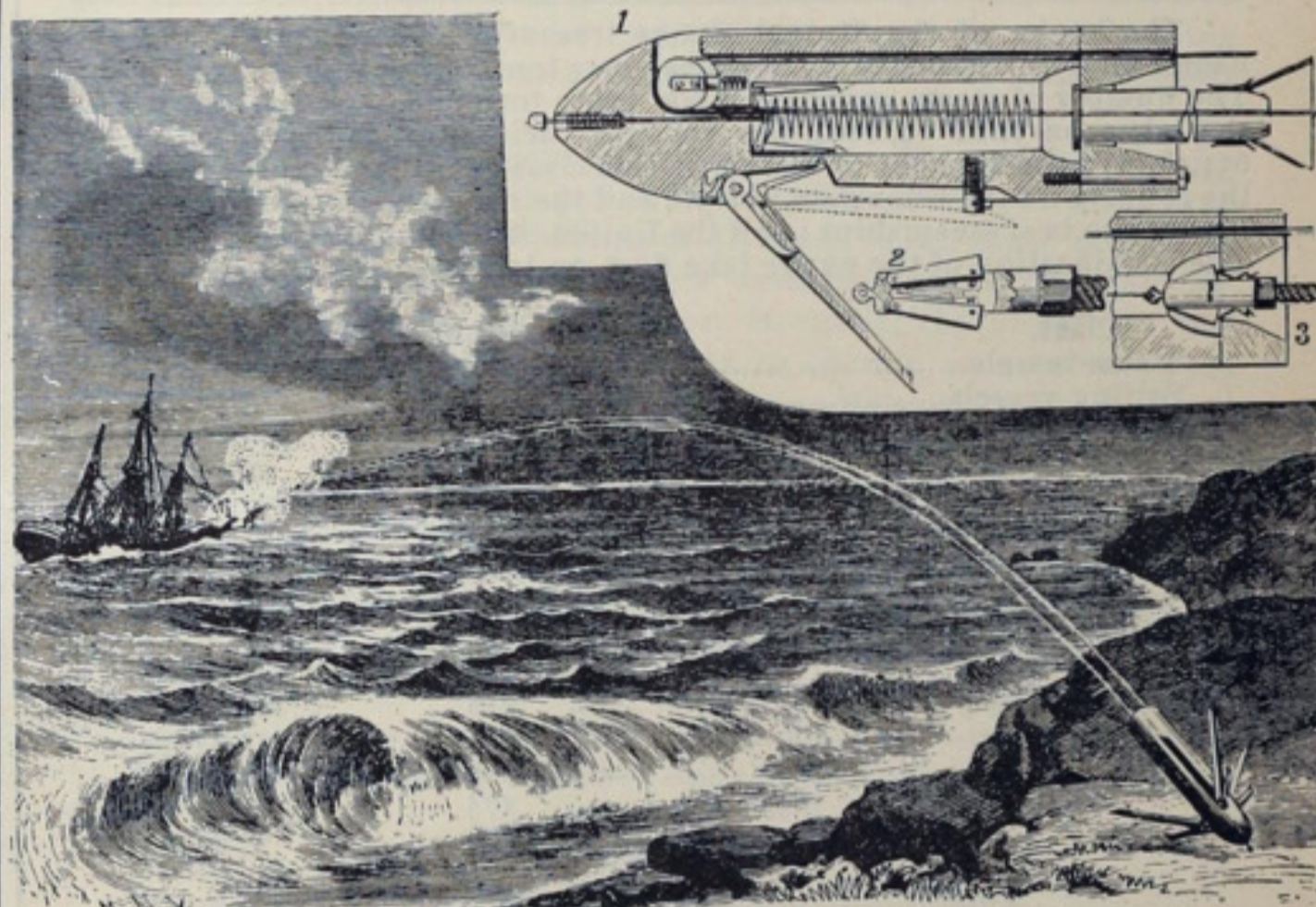
11. As the provisions of the act of March 2, 1895, are in substantial accord with the measurement laws of the principal maritime nations, applications for an appendix, stating separately the measurement of spaces which may be deducted by the laws of other nations but not by the laws of the United States, if there be any, should be referred to the commissioner of navigation.

EUGENE TYLER CHAMBERLAIN,
Commissioner of Navigation.

Approved: S. WIKE,
Assistant Secretary of the Treasury.

To Throw Life Lines from Vessels.

To facilitate establishing communication from a disabled or drifting ship with the shore, Mr. Anton Schmitt has patented the apparatus shown in the accompanying illustration, the introduction of which is being promoted by the Rev. Albert Stroebele of Butler, N. J. On the vessel is carried a cannon adapted to fire a projectile in the form of an anchor having grapnell arms, to hold the anchor where it strikes, the anchor carrying a line having one end fastened on the carriage of the cannon while the other end unwinds from a drum on the carriage, the two ends of the line thus remaining on board the vessel. One end of a line thus connected



with the shore may then be attached to a heavy chain or cable, and the latter drawn out and fastened in the anchor, affording means, by the aid of a drum or windlass on shipboard, of drawing the vessel toward the shore. Fig. 1 is a sectional side view of the anchor, whose body has a bore registering with a conical bore in the base, through which pass one run of the line, which extends around a pulley in yielding bearings in the head, and through registering apertures in the body and base, to return to the drum on the carriage. A tube loosely held in the bore of the body is adapted to engage a funnel in the base to form a guideway for the head of the heavy chain or cable when the latter is to be connected with the anchor, as shown in Fig. 3. On the front of this tube is a flanged cap, on which presses a spring normally compressed by hooks which engage the flange, the hooks being pivoted at their rear end on links connected with a rod extending to the front end of the body. The head of this rod first strikes the ground when the anchor is fired, disengaging the hooks and permitting the spring to force the tube and funnel outward, as shown in Fig. 1. Pivoted in recesses in the sides of the body are three grapnell arms, each arm being recessed to receive a pivoted arm. Each arm is normally held in closed position by the wall of the barrel, but they are all forced outward by springs when the anchor is fired, the shorter arms being rigidly and the longer elastically held open. The head for the chain or cable to be connected with the anchor by means of the lines, after the anchor has been thrown ashore, has pivoted wings normally folded into a recess of the head, as shown in Fig. 2. These wings are spring-pressed, and are closed when drawn through the funnel in the base of the anchor, after which they swing outward and abut against the inner face of the base, whereby the head is securely connected with the anchor, and a strong connection is thus made between the anchor and vessel.

In the Suez as well as the St. Mary's Falls canal the average size of vessels is constantly increasing. From returns showing the draught of water of vessels navigating the Suez during the last nine years it appears that the percentage of vessels drawing less than 23 feet declined from 68.93 in 1893 to 65.8 in 1894, while vessels drawing more than 23 feet increased from 31.07 in 1893 to 34.2 in 1894. The maximum draught allowed for vessels passing through the canal is 25 feet 7 inches, and the increase in the size of vessels is shown in a remarkable manner by the fact that 172 vessels, drawing more than 24 feet 7 inches, used the canal, as compared with 164 in 1893 and 127 in 1892, representing a percentage of 3.20 in 1891, 3.57 in 1892, 4.91 in 1893, and 5.1 in 1894.

MEMBERS OF THE SHIP MASTERS' ASSOCIATION WHO DO NOT FIND IT CONVENIENT TO CALL AT THE PLACES MENTIONED IN A RECENT ISSUE OF THE REVIEW TO RECEIVE COPIES OF THE 1895 DIRECTORY ADDRESSED TO THEM, CAN OBTAIN A COPY BY CALLING AT THE OFFICE OF THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.



DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels.....	1,731	843,239.65
Sailing vessels.....	1,139	302,985.31
Canal boats.....	386	41,961.25
Barges.....	85	39,214.51
Total.....	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30,	Number.	Net Tonnage.
1890.....	218	108,515.00
" " " 1891.....	204	111,856.45
" " " 1892.....	169	45,168.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
Total.....	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.
(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

SECRETARY KEEP of the Lake Carriers' Association is engaged in making certain calculations on the carrying capacity of the lake fleet at different stages of water in the rivers. The task will undoubtedly prove a difficult one, but Mr. Keep will make the best of it, and present some estimates that will be quite valuable. The work has been taken up at the request of Gen. Poe, who is at the head of the commission of government engineers appointed to investigate the probable effect of the Chicago drainage canal on lake levels. It is hardly expected that the engineers will be able to make a definite statement regarding the effect of the canal, but the information that will be brought out on the subject will be of some value. Gen. Poe has asked Mr. Keep to make an estimate of the effect on the carrying capacity of the lake fleet of the lowering of the lake levels 3, 6 and 9 inches, these being the limits of the expert estimates regarding the result of the opening of the canal. Mr. Keep has not yet arrived at any conclusion, but has begun in this way: Taking the entire fleet, he has divided it into classes according to tonnage, making quite a large number of classes. From the books of vessel owners and brokers he will find the draft of a few in each class at full capacity and also capacity at 3 and 6 inches less draft. Then from estimates as to the average number of trips made during a season by steam and sailing vessels, the difference in capacity of the entire fleet at different drafts will be made up.

LOSSES on the steel steamers German, Corona and Alva during the past week will probably add another \$100,000 to the already large amount which the insurance companies have been compelled to pay out since the opening of navigation. Although the steamers Corona and German were not ashore, but simply struck bottom in Poverty passage, their repair bills will foot up fully \$20,000. The underwriters have certainly been compelled to give up more for losses this spring than during any spring in previous years, and the greater portion of these losses have been on what are considered the best steel risks, for which low rates of insurance were provided before the opening of navigation. On this account, there is fear of higher rates next year, but the season is not yet at an end, and the foreign companies that have come into the business

must have known of big profits in it in the past or they would not have made the reduced rates that have prevailed of late.

LAKE vessel owners have wondered why the Canadian marine department has not provided lights and other aids to navigation at points on the lakes where it has been necessary to resort to private subscription, in order to secure the safe passage of vessels through dangerous channels. The reason is plain. There is no lack of interest in the lake marine among officials of the marine department of the dominion, but they are unable to secure appropriations and have not the money for such purposes. In all parts of Canada the expenditure for maintenance of light-house and coast service amounted in 1894 to only \$442,507.34, and for construction of lights \$28,041.93, or a total of only \$476,225.85.

IT WOULD seem that lake newspapers should adopt the decisions of the United States board on geographical names relative to the spelling of the names of islands, cities and towns on the lakes. Some confusion would thus be avoided and there would be an advantage in uniformity. This board some time ago decided that in all government publications the name of the new iron range in Minnesota would be spelled Mesabi, but it is still spelled in half a dozen different ways by most publications around the lakes. The board has lately decided that the name of Lake Superior's greatest island shall be spelled Isle Royal and that Point Abino shall be called Point Albino.

THE announcement from the Canadian marine department that the government steamer Bayfield will this season be engaged on a survey of the north shore of Lake Erie is undoubtedly prompted by disputes that have arisen over the confiscation of boats and nets of fishermen from Cleveland and other Ohio cities, who are charged with fishing in Canadian waters. The main object of the Canadian government in beginning the Lake Erie survey, instead of continuing work on Georgian bay, is to define boundary lines.

Defining Salvage.

In the case of Edward Smith and others of Buffalo, owners of the steamer Venice, against the steamer Spokane, which was tried at Buffalo recently, some high court opinions on salvage were quoted. These opinions are, of course, not new to admiralty lawyers, but they cover salvage questions in a general way and are accordingly interesting to anyone acquainted with shipping matters. One of them, from reports of decisions of the English high court of admiralty, is as follows:

"The ingredients of a salvage service are, first, enterprise in the salvors in going out in tempestuous weather to assist a vessel in distress, risking their own lives to save their fellow creatures, and to rescue the property of their fellow subjects; secondly, the degree of danger and distress from which the property is rescued, whether it were in imminent peril and almost certainly lost if not at the time rescued and preserved; thirdly, the degree of labor and skill which the salvors incur and display, and the time occupied; lastly, the value. Where all these circumstances concur, a large and liberal reward ought to be given; but where none or scarcely any take place, the compensation can hardly be denominated a salvage compensation; it is little more than a mere remuneration *pro opere et labore*."

Another decision from the United States circuit court of appeals (the Rita, 62 Federal Reporter, 761) is as follows:

"Salvage, in its simple character, is the service which volunteers spontaneously render to the owners in the recovery of property from loss or damage at sea under the responsibility of making restitution, and with a lien for their reward. Salvage is the compensation due to persons by whose voluntary assistance a ship or its lading has been saved to the owners from impending peril, or recovered after actual loss. Salvage consists of an adequate compensation for the actual outlay of labor and expense used in the enterprise, and for the reward or bounty allowed from motives of public policy as a means of encouraging extraordinary exertions in the saving of life and property in peril at sea. The amount awarded as salvage comprises two elements, viz, adequate remuneration and a bounty given to encourage similar exertions in future cases, the relative amount to depend on the special facts and merits of each case. The leading considerations to be observed in determining the proportion or amount of an award for salvage are well defined. We are to consider, (1) the degree of danger from which the lives or property are rescued; (2) the value of the property saved; (3) the risk incurred by the salvors; (4) the value of the property employed by the salvors in the wrecking enterprise, and the danger to which it is exposed; (5) the skill shown in rendering the service; (6) the time and labor occupied. These are the ingredients which must enter, each to a greater or less degree, as an indispensable condition into every true salvage service."

Supt. A. W. Machen of the free delivery service, post office department, will visit Detroit this week to confer with the postmaster of that city in regard to the new service on the Detroit river.

Around the Lakes.

Geo. Y. Wisner, well-known engineer of Detroit, called on friends in Cleveland a few days ago.

Hurd & Hanenstein, Buffalo lumber dealers, are figuring on building a steel consort for their steamer Wotan.

A part of the plant of F. W. Wheeler & Co. which has been devoted to wooden ship building is being added to the iron yard, so as to provide room for four keels of steel vessels, each of 400 feet length.

Freight steamers of the Northern line have for some time past been carrying to Buffalo from Duluth large quantities of Washington shingles, which are brought from the Pacific coast to the head of the lakes over the Great Northern railway.

Secretary Herbert of the navy has promised Cleveland naval reserve enthusiasts that he will supply their organization with a part of its equipment and will make arrangements so that they can obtain practical training on an occasional cruise aboard the Michigan.

Capt. M. M. Drake's new steel steamer Chili left the ship yard of the Cleveland Ship Building Company for Buffalo on Saturday last, and is now on her way up the lakes with 3,600 tons of coal, on an average draft of 15 feet 3½ inches. Supt. James Wallace of the Cleveland Ship Building Company was with the boat on her delivery to Buffalo owners.

Escanaba ore trimmers have finally gone to work at 2½ cents a ton, so that that rate now prevails at all ore shipping ports. It is probable, however, that the ore trimmers will lose considerable work as a result of the troubles of the past two months, as at least two of the leading ore-carrying lines, the Minnesota and Inter-Ocean companies, are carrying ore in some of their steamers without trimming.

As a result of the resignations of Capt. J. Dunn of the steamer Corona and Capt. Frank Stenton of the German, some promotions have been made on the steel boats controlled by M. A. Hanna & Co., of Cleveland. Wm. Baxter, mate of the German, has been given command of her. Capt. Stephen Murphy of the Cambria goes to the Corona, and Martin Johnson, who has been mate of the Corsica for several seasons, is now master of the Cambria.

The fog signal at Buffalo now gives blasts of 3 seconds duration separated by silent intervals of fifty-seven seconds. The sounding board and reflector, which is to be tried at Buffalo, and which is expected to reduce the sound of the signal in the city, will be erected as soon as possible. The illuminating apparatus in the light on the north pier at Ahnapee, Wis., will be changed from a lens lantern to a fifth order lens and light.

Ship builders will be interested in an advertisement elsewhere in this issue calling for bids on a revenue cutter to be built for the lakes, and for which \$175,000 has been provided. A description of the boat, which was prepared from the plans, was printed in the last issue of the REVIEW. Bids are to be opened on June 20 and the boat is to be finished by July 1 of next year. Specifications, blue-prints, etc., may be had by addressing the chief of the revenue cutter service, Washington, D. C.

New lake vessels registered during the week ending May 18 in the office of the United States commissioner of navigation are: Steam—North Land, Cleveland, O., 4,244.00 tons gross, 2,339.78 net, No. 130,690; Frank L. Bapst, Buffalo, N. Y., 42.39 tons gross, 28.82 net, No. 120,993; Tempest, Toledo, O., 67.55 tons gross, 40.76 net, No. 145,687. Sail and unrigged—Puritan, Cleveland, O., 8.88 tons gross, 6.00 net, No. 150,698; Joseph F. Kennedy, Buffalo, N. Y., 140.94 tons gross, 140.94 net, No. 46,461.

In a letter to supervising inspector General Dumont of the steamboat inspection service, the captain of the Cayuga, which was sunk in the straits as a result of collision with the steamer Hurd, says that when the Hurd was first observed she showed her green light two points on the starboard bow of the Cayuga. A fog bank arose, he says, and shut out all lights. The Hurd sounded two blasts of her whistle, and the Cayuga, fearing the consequences of a cross signal in a law-suit, and knowing that the Hurd was so close and so far over on her starboard bow, stopped and reversed her engines, but the accident was not averted. There would have been no collision, the captain of the Cayuga says, if the Hurd had also stopped and backed. This is of course, only one side of the story.

It is probable that few people who know Superintendent Day of the Conneaut coal and ore docks, are aware of his early connection with lake shipping. He commanded lake vessels as early as 1853, when he sailed the schooner Lavina in the grain trade between Cleveland and Ogdensburg. In those days grain was loaded from canal boats in small hand-buckets, being passed along a line of men, hand-to-hand, until it reached a hopper on board the vessel, where it was weighed. Capt. Day came ashore in 1865, and was for a long time engaged in dock and commission business on his own account in Cleveland. He was made superintendent of the Nypano ore docks, Cleveland, in 1872 and remained in that position until he accepted his present charge at Conneaut.

Improvement in All Branches of the Iron Industry.

Besides the advance in wages to employes, which is a sure sign of industrial prosperity, there are many other indications. The consumption of metals for manufacturing purposes is steadily increasing. Our iron output, which is now at the rate of over 8,000,000 tons per annum, is being absorbed as rapidly as produced, and at many plants it has been necessary to ship reserve stocks to fill orders. Railroads are beginning to come into the market for supplies to be used on repairs which have been delayed for some time past. Manufacturing plants of all kinds are pushing their business as they have not done for the past three years. Mining work is being actively prosecuted in the west and, as shown in our weekly news from all the leading mining centers, the work is being carried on in a substantial, business-like manner, which will insure steady and permanent growth.

As we have frequently said in these columns, the result of the depression in trade, or rather in prices, during the past two years, has been to compel industrial establishments of all kinds to introduce economies in every detail of manufacture. Wages were reduced; extra labor dispensed with; repairs made only when essential; old machinery was used, or when necessary, changed so as to operate economically; the item of supplies was cut down to absolute essentials, and extensions and additions of machinery, or changes in plants, only made when necessary or where a manifest economy would result immediately. As a consequence our manufacturers are entering this period of reviving prosperity with their employes trained to cheap production, and their establishments yielding a greater output per unit of labor and power expended than ever before in the history of the country. With the revival in trade comes the need of more appliances to manufacture the additional output, and this affects every line from the producer of the finished product to the miner who takes the ore or coal from the ground.—Engineering and Mining Journal.

Trade Notes.

Capt. J. W. Brion and Engineer Charles R. Davis of the steamer Caledonia have written the Buffalo Forge Co. commending the blower system put into their steamer. They say the apparatus thus far answers all demands made upon it and they are gradually decreasing the cost of fuel.

Anyone interested in marine water tube boilers, steel plate steam fans, blowers of any kind, engines, etc., will find a great deal of valuable information in the new general catalogue, No. 29, just issued by the Huyett & Smith Mfg. Co. of Detroit. The catalogue is a very neat specimen of printing and its diversified contents is indicative of the extensive business of the Detroit firm. In our issues of April 11 and 25 the water tube boiler made by this firm, as well as a blower adapted to steamboat use, are described.

A dredging steamer being built at the ship yard of Hugh Ramsay, Perth Amboy, N. J., for government work at Galveston, Tex., is equipped with two centrifugal pumps, each having a capacity of 300 cubic yards of sand per hour, and which deliver into internal hoppers in the vessel having a capacity of 600 cubic yards. The dredge is a complete vessel, as she has propelling engines of the compound type, capable of developing 500 horse power, and is equipped with modern steering apparatus, electric lighting plant, etc.

In conversation with Mr. Diefenbach, superintendent for the Port Huron Wrecking and Transportation Co., it was learned that this company has all facilities necessary for raising the Cayuga, providing she is not in more than 100 feet of water. Mr. Diefenbach is of the opinion that the wreck is not in the 120-foot hole, as he shows on the chart that the location of that deep spot is considerably out of the course held by the Cayuga at the time of the collision. In addition to the usual wrecking outfit of hydraulic jacks, chains, hoists, etc., the Port Huron company has a complete outfit of pontoons and the steam barge Mary Groh fitted with derricks and steam hoisters.

G. K. Jackson of Bay City has brought suit against U. Grant Grummond of Detroit, as a result of difficulties that have arisen over the wreck of the steamer Burlington. The Burlington burned and was sunk on the Canadian side of Detroit river, near Detroit, in the spring of 1894. After remaining in this position all of last season, she was ordered removed by Canadian authorities. Grummond raised her, towed her to Detroit, and libeled her for salvage, and a decree was granted in his favor. In January last the boat was again sunk by ice, and while on the bottom of the river was bought in by Grummond at marshal sale for \$1,100. Mr. Jackson claims that when Grummond was engaged by the Canadian government to remove the wreck, he notified him that he would hold him responsible for her. He also claims that the Detroit sale did not bring full value for the boat, as purchasers other than Grummond had no opportunity of determining the value.

W. & A. FLETCHER CO.

NORTH RIVER IRON WORKS.

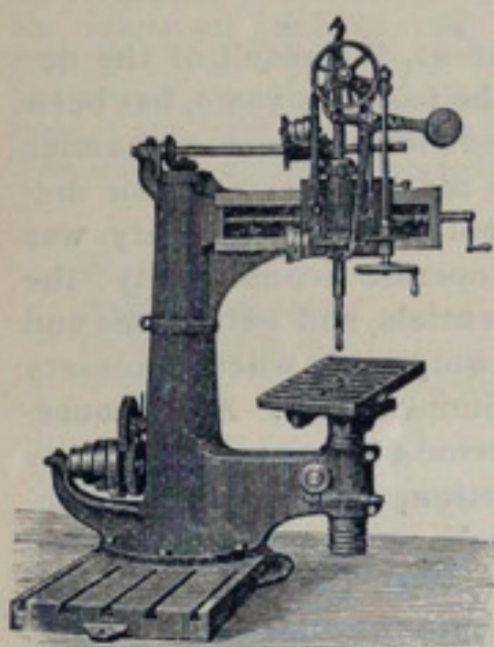
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THE MOST ARTISTIC MARINE PHOTO EVER MADE, THE NORTH WEST,
PICTURE 4 BY 5½ INCHES, MOUNTED ON HEAVY 8 BY 10 CARD—SEND 50
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TREASURY DEPARTMENT, WASHINGTON, D. C., May 27, 1895. Sealed Proposals are hereby invited and will be received at this department until 2 o'clock p.m., on Thursday, June 20th, 1895, at which time and place they will be opened in the presence of attending bidders, for the construction by contract of one steel steam propeller for the Revenue Cutter Service of the United States, for service on the Great Lakes, to be known while in course of construction or until launched, as "No. 1, R. C. S." The limit of the appropriation for the construction and completion of this vessel is \$175,000.00. Said vessel is to be constructed in accordance with plans and specifications provided by the Secretary of the Treasury. Plans and specifications for the construction of said vessel may be seen and examined at this department at any time after the 1st day of June, 1895, and blue prints will be furnished to bidders upon application to this department at any time after that date, and printed specifications a few days later. Instructions to bidders and contractors, forms of proposals and contract, bond and bondmen's oath, may be obtained at any time after June 1st, 1895, on application to the Division of Revenue Cutter Service, Treasury Department, where all information essential to bidders can also be obtained. Proposals for construction of said vessel will be considered only from such ship-builders as can show to the satisfaction of the Secretary of the Treasury that they are possessed of the necessary plant and facilities for the performance of the work. Evidence as to this ability must be submitted to the department at time of filing the proposal or not later than 2 p.m., June 20th, 1895. Each proposal must include the construction of both the vessel and her machinery, complete in all respects as required by the plans and specifications. The said vessel must be completed and delivered at some port on Lake Michigan that may be designated by the Secretary of the Treasury on or before July 1, 1896, and bidders are informed that because of the urgent need of speedy delivery of said ship, the element of time to be consumed in the construction of said vessel will be given due consideration in determining the award of the contract. Each proposal must be accompanied with a cash deposit or certified check payable to the order of the Secretary of the Treasury in the sum of \$5,000.00, which shall become the property of the United States, in case the successful bidder shall fail to enter into the requisite contract and furnish the requisite security on the acceptance of his proposal. Bids must be addressed to the Secretary of the Treasury, and be endorsed on the envelope "Proposal for building a steam revenue vessel for the Great Lakes." The right is reserved to reject any or all bids, and to waive defects if deemed for the interest of the government so to do. S. WIKE, Acting Secretary.

U. S. ENGINEER OFFICE, 34 WEST CONGRESS ST., Detroit, Mich., May 8, 1895. Sealed proposals for furnishing all labor, materials and appliances, and removing material from moveable dam and from 800-foot lock approaches, also for constructing piers for lock approaches, will be received here until 2 P. M., June 7, 1895, and then publicly opened. All information furnished on application. O. M. POE, Col., Engrs. May 30

TO IRON MANUFACTURERS. Office of U. S. Light House Engineer, 9th District, Detroit, Mich., May 21, 1895. Sealed proposals will be received at this office until 3 p. m. of Monday, the 10th day of June, 1895, for furnishing the material and labor of all kinds necessary for the construction, erection and delivery of the iron tower at Calumet Pierhead, Ill. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light House Engineer. May 30

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350 STYLES AND SIZES.
OVER 5000 IN USE.

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Always on Watch,
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It never tires, or goes to sleep, and is reliable at all times.

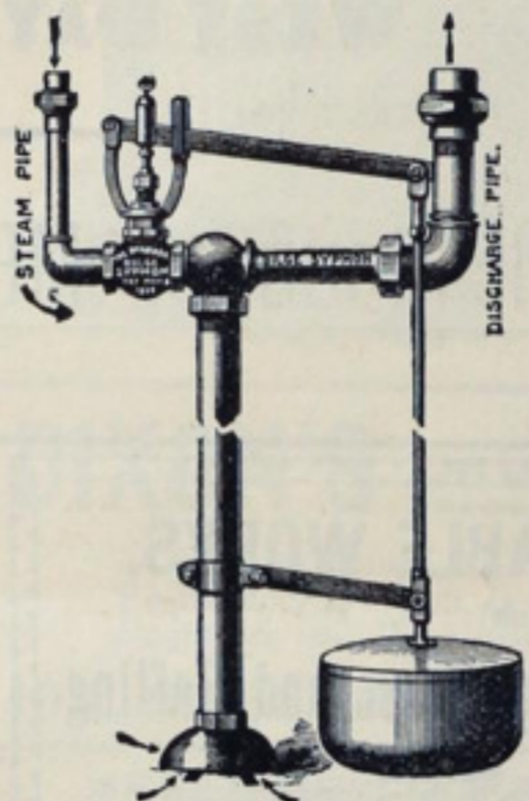
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They are indorsed by leading Engineers throughout the country.

They commend themselves wherever placed. A dry bottom in ship's holds gains speed, which is equal to money.

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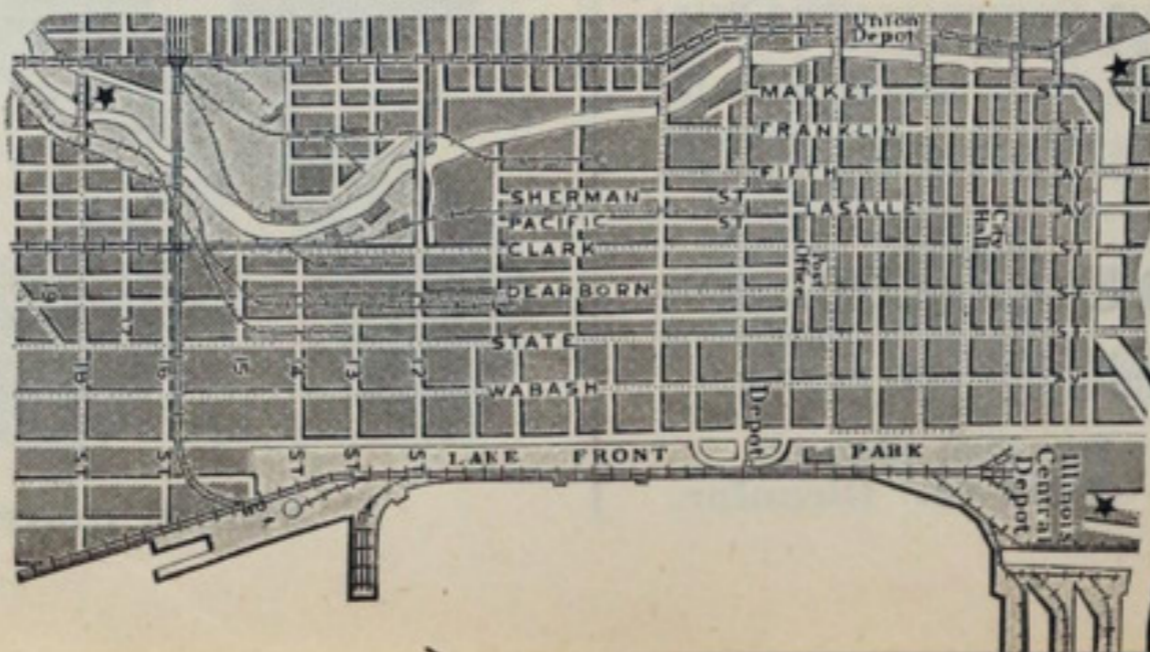
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Halsted and Division Sts., Canal	60,000
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South Halsted St. Bridge, South Branch	60,000

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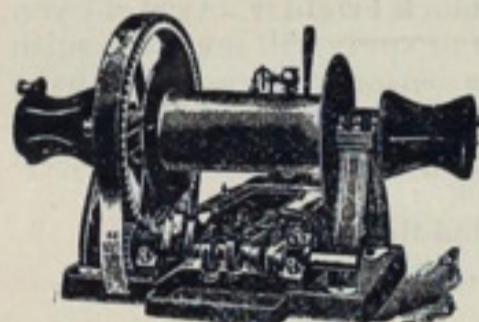
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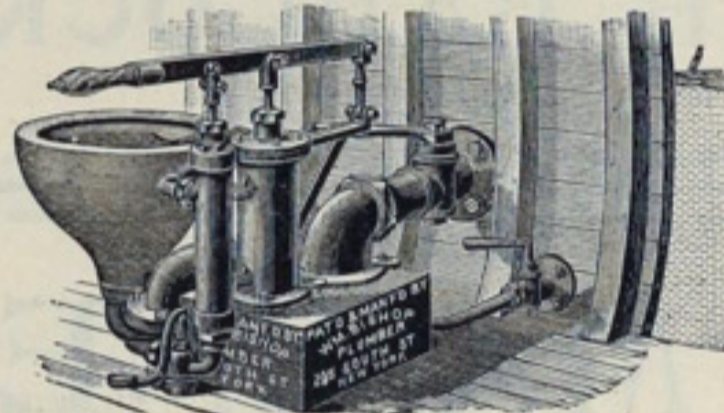
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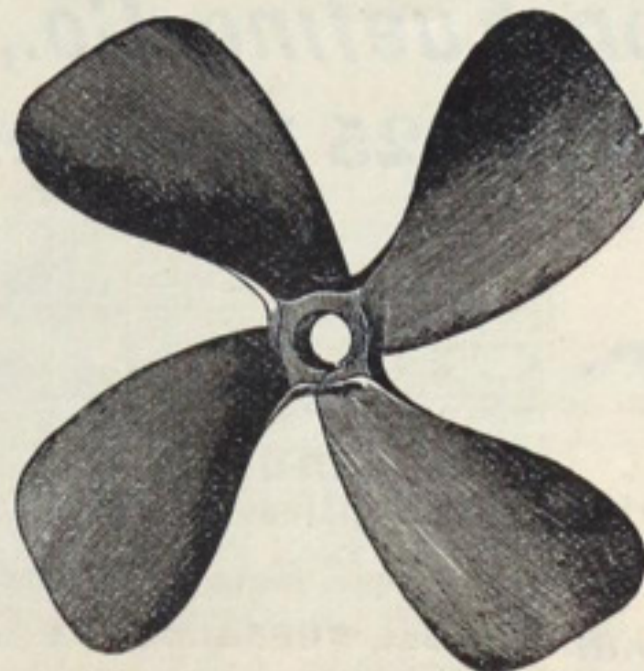
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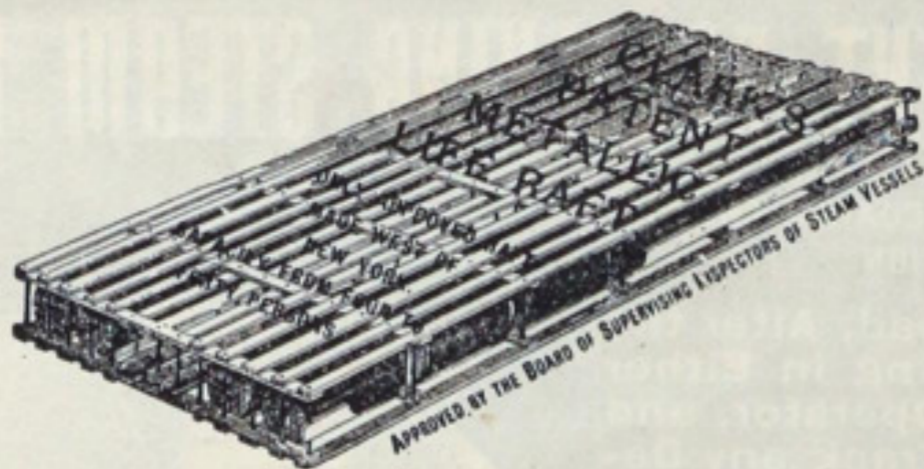


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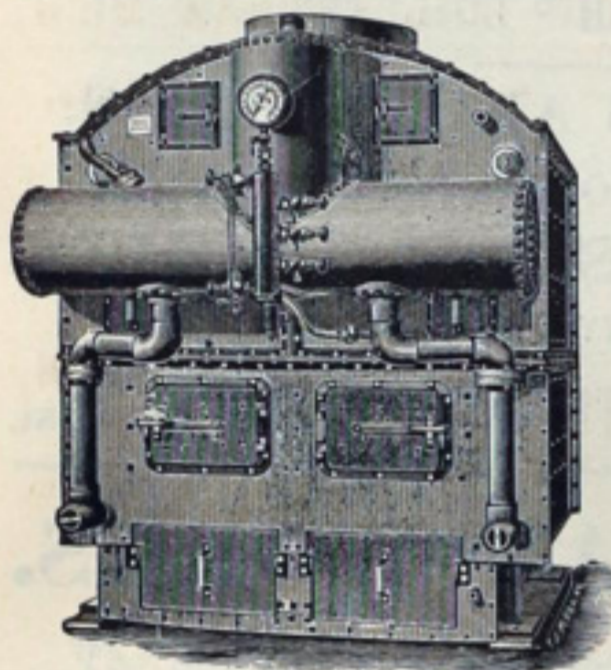
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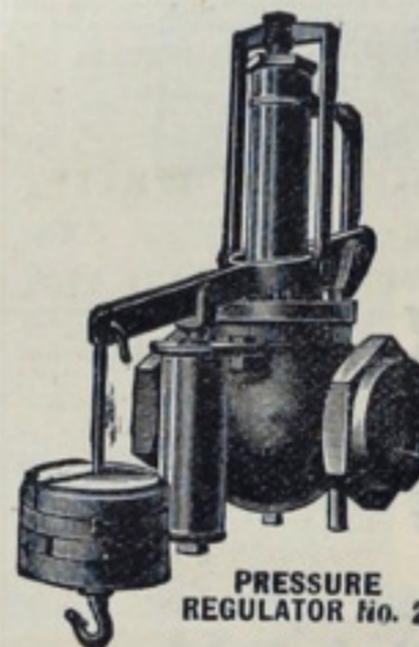
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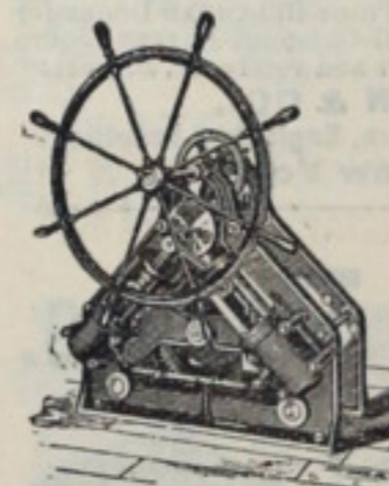
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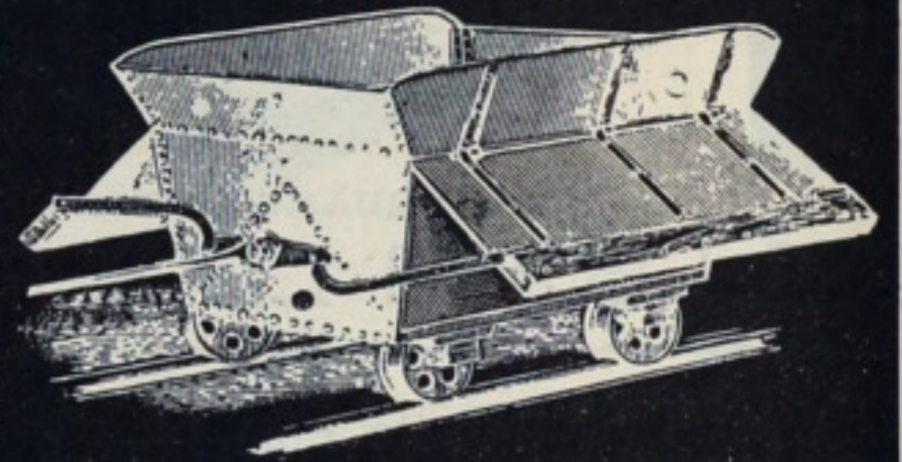
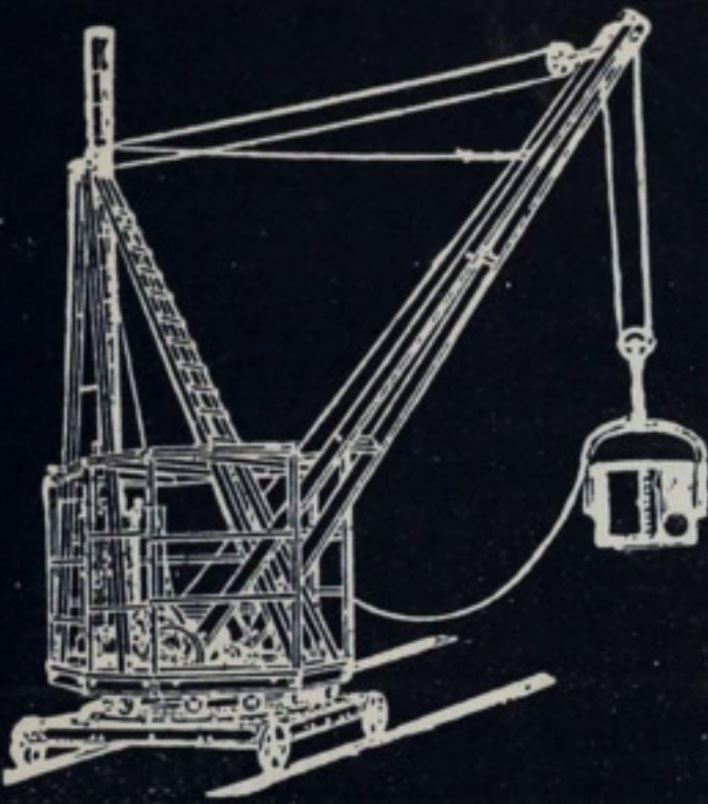
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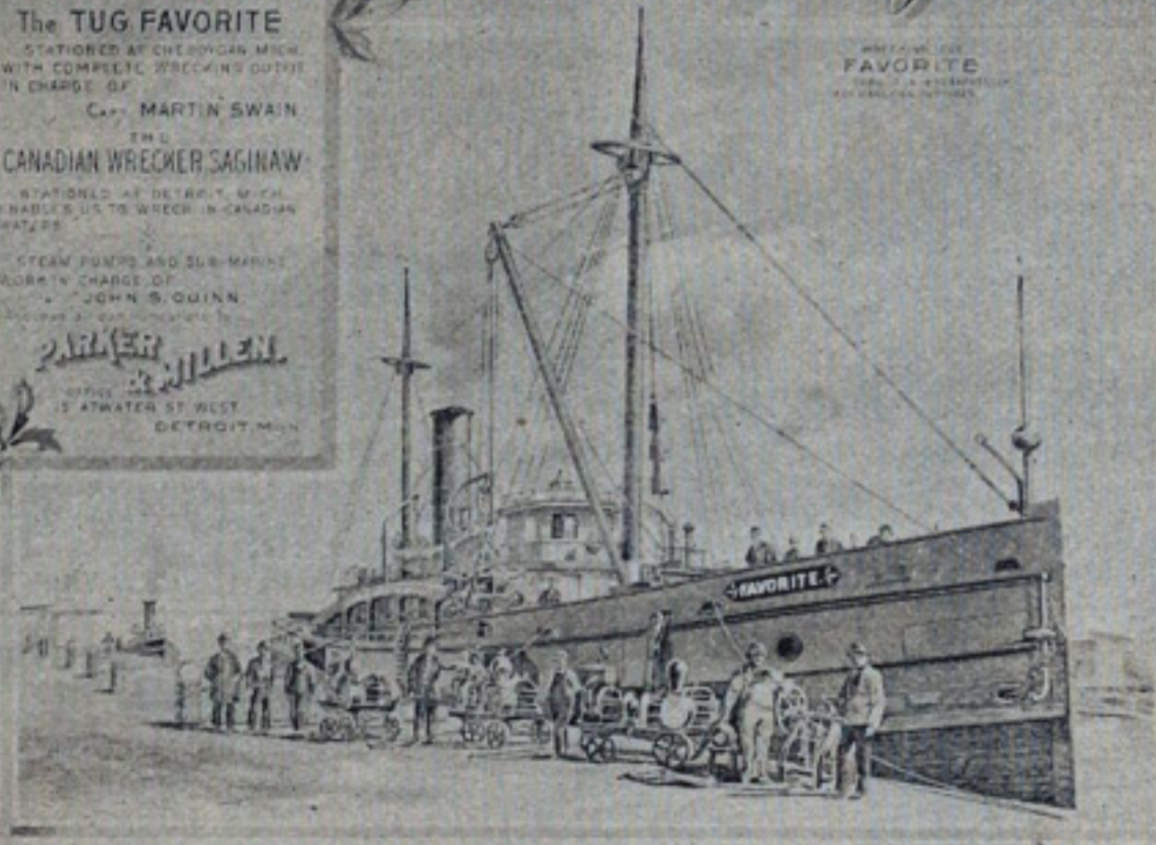
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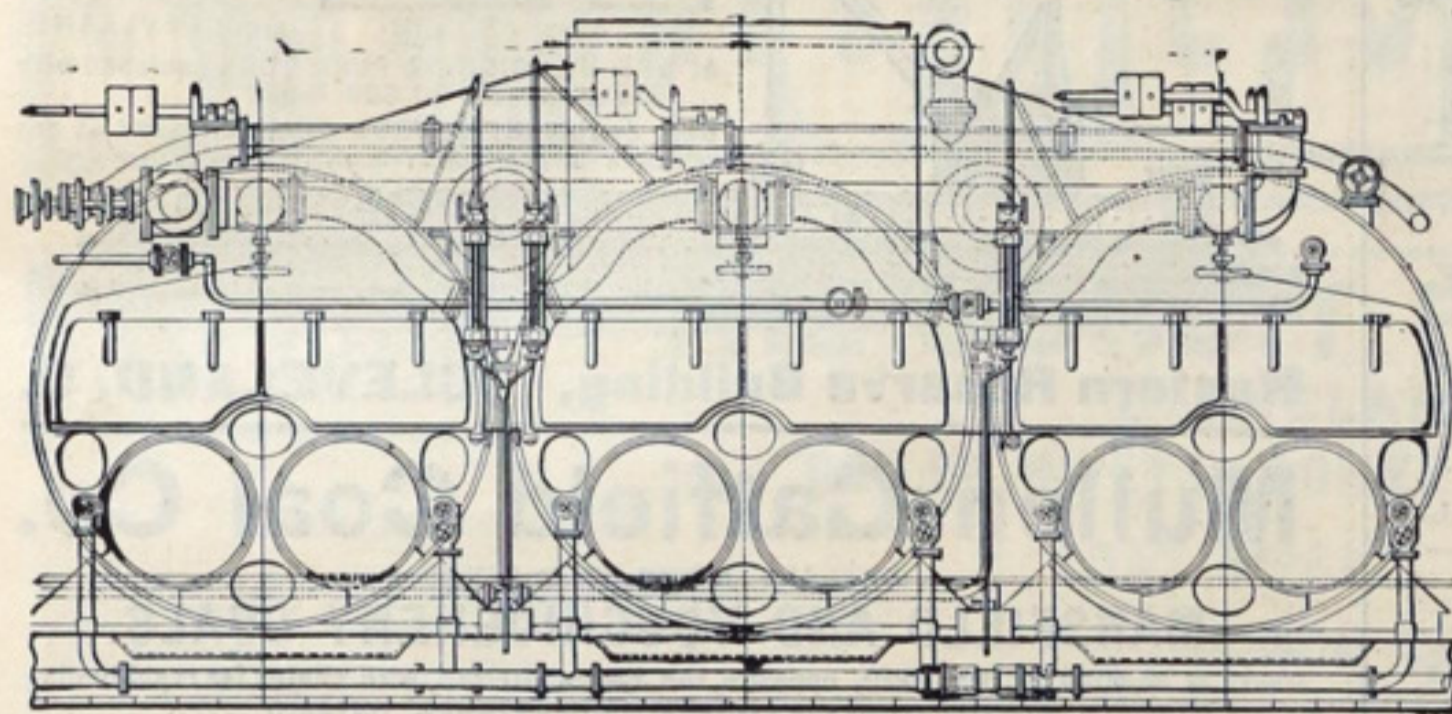
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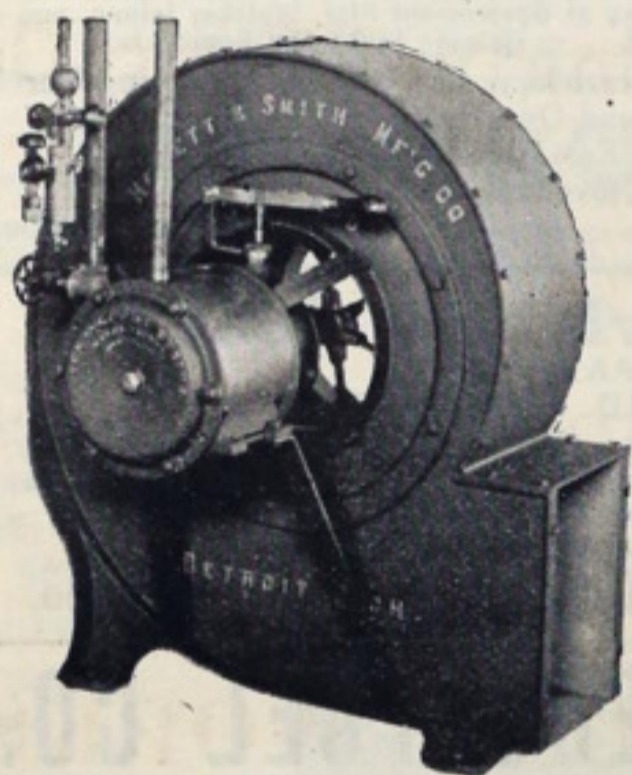
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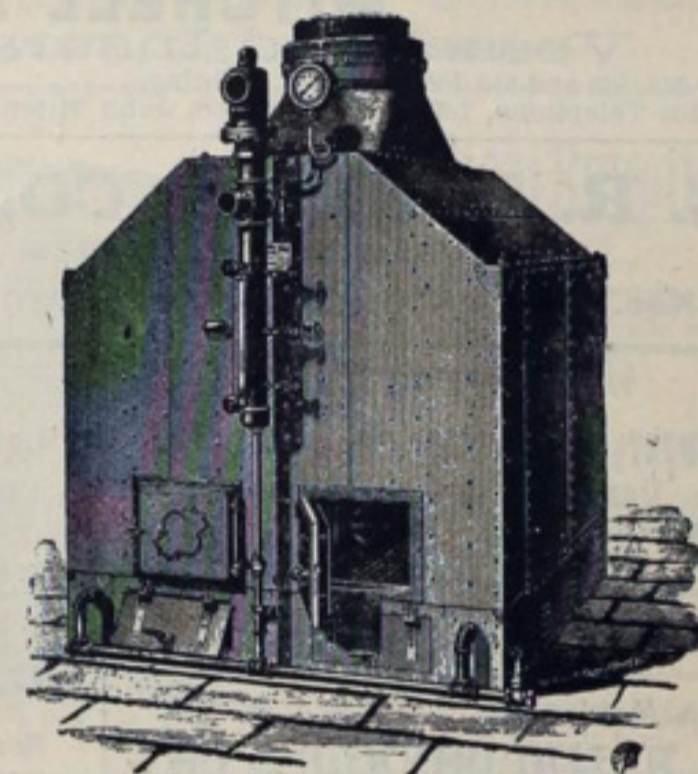
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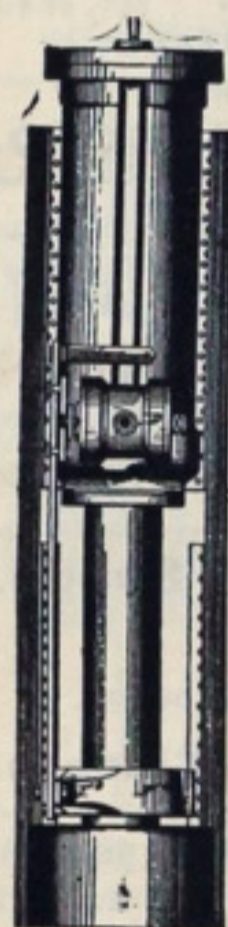
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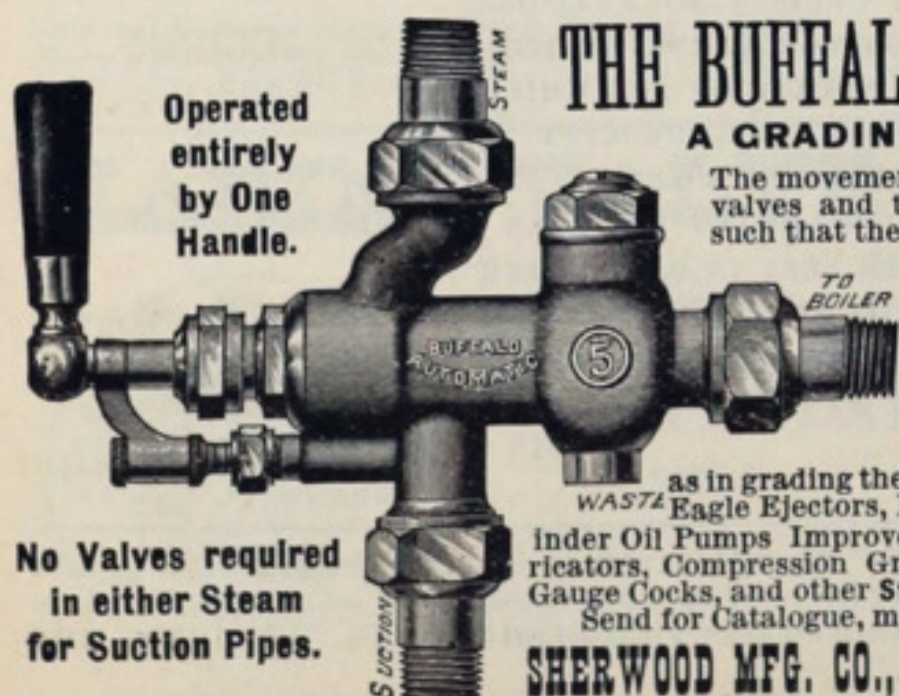
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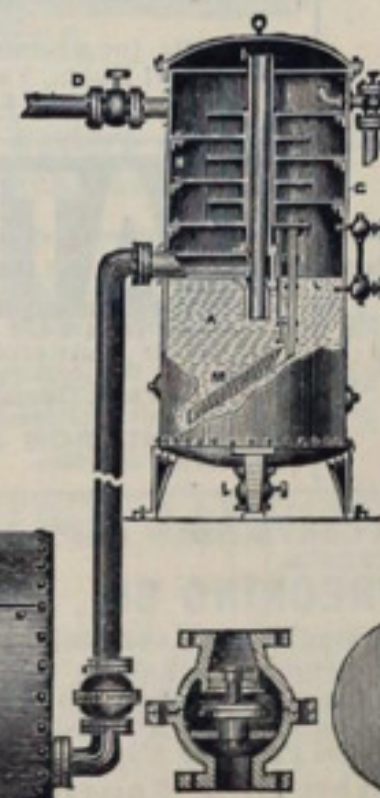
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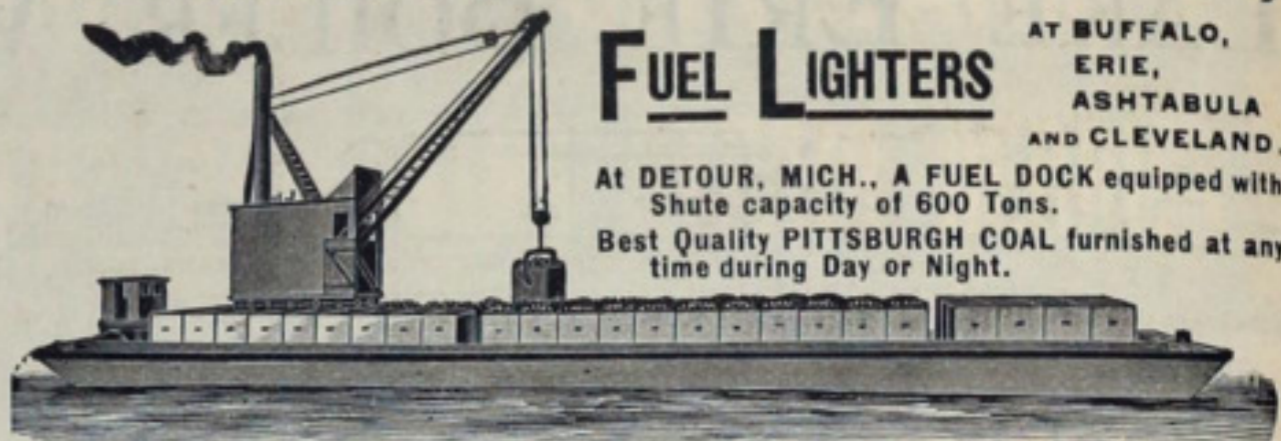
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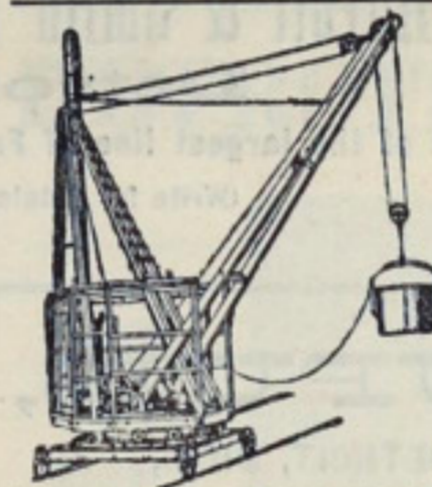
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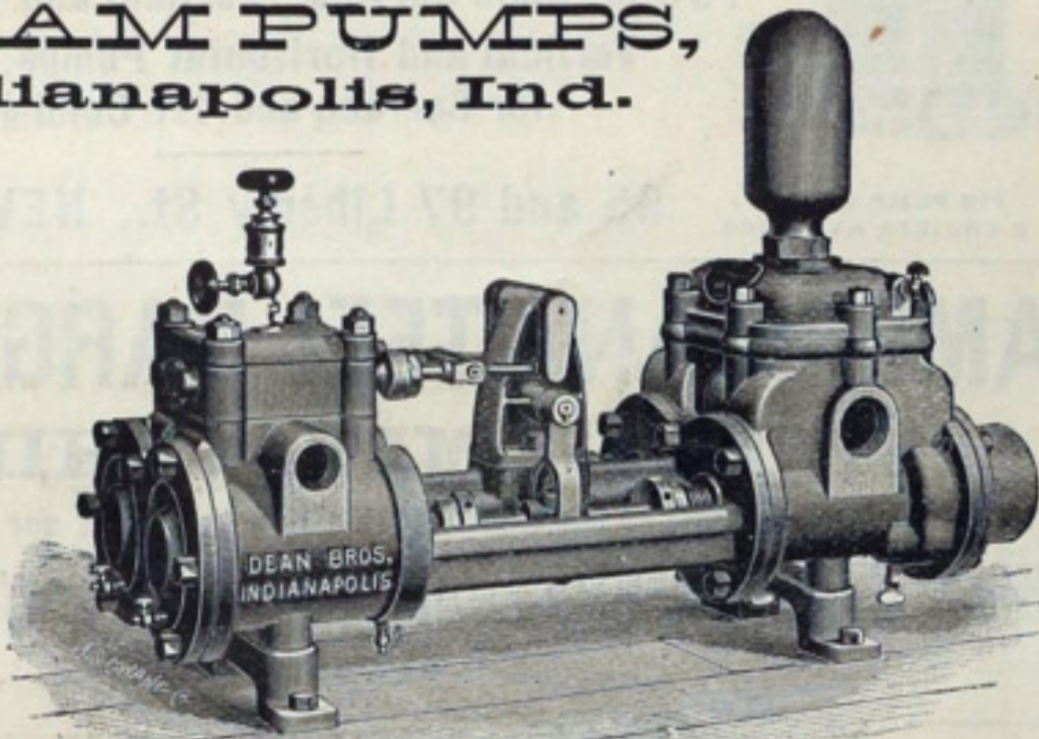
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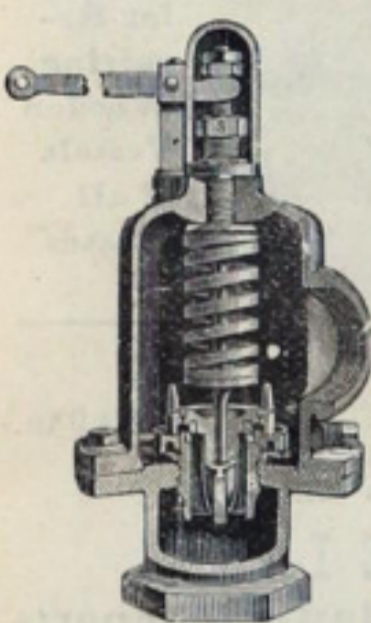
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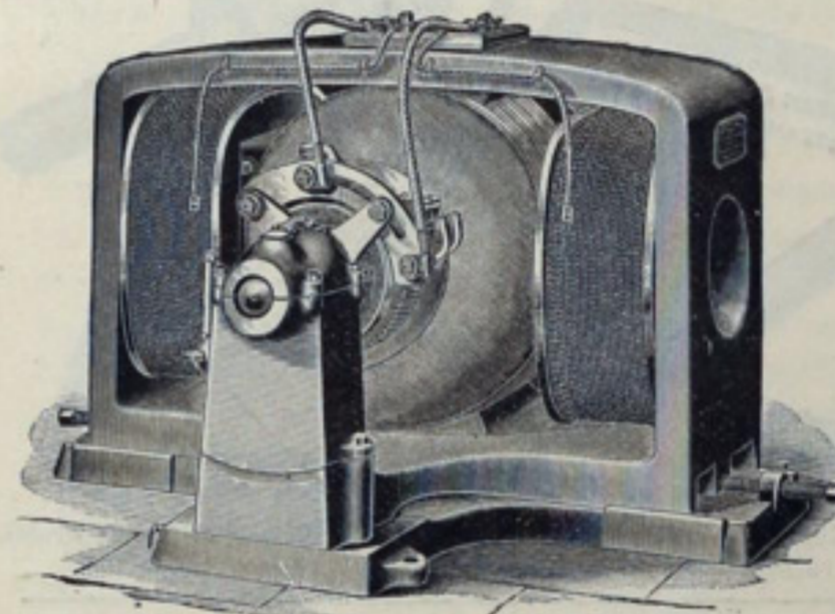
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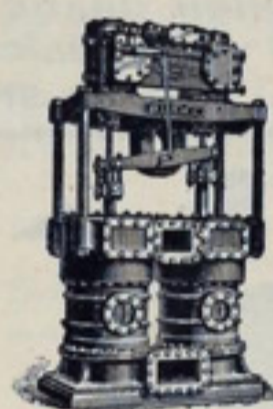
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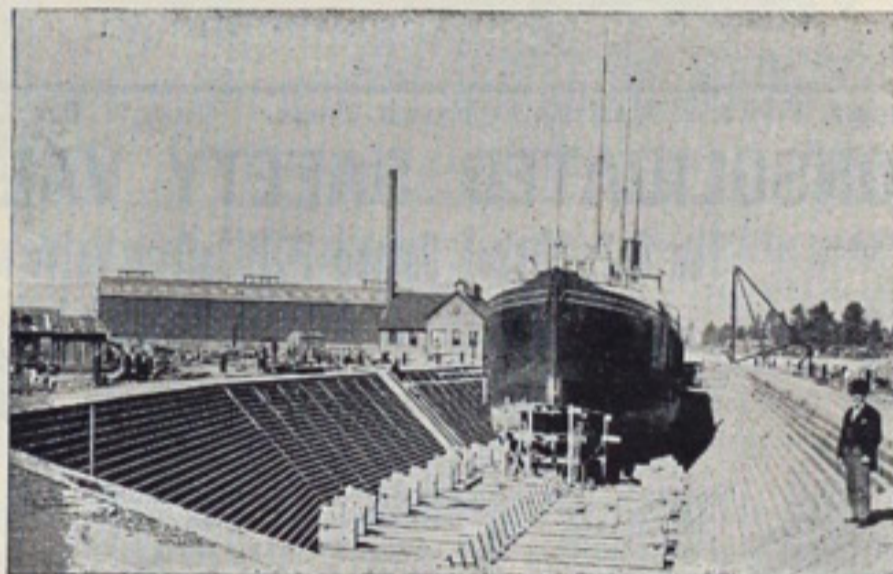
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Breadth, Bottom.....52 "	Depth over Sills.....18 "

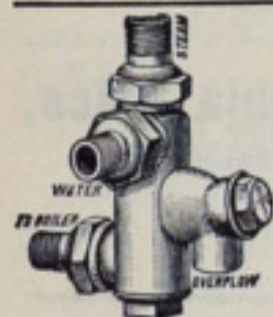
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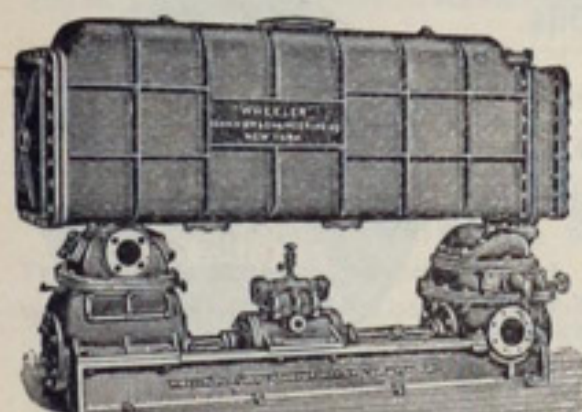
Wheeler Standard Surface Condenser.

Wheeler Admiralty Surface Condenser.

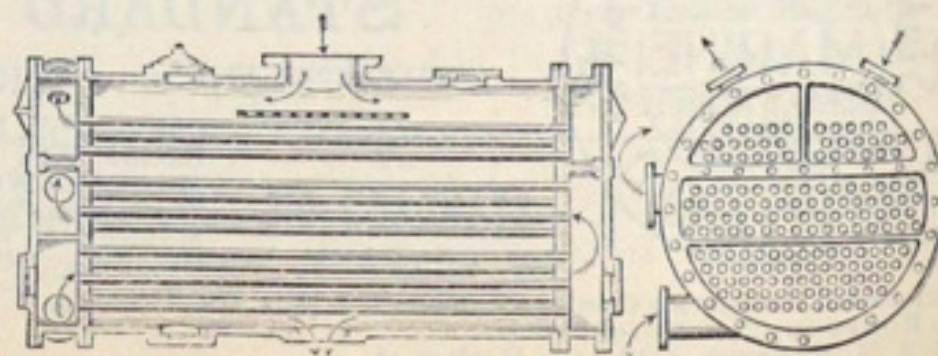
Wheeler Lighthall Surface Condenser.

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Patent Combined Surface Condenser & Feed-Water Heater.